

1 -14.(New) A powerplane for use in a backplane power distribution system, comprising:
2 (a) a conductive sheet;
3 (b) at least one source location on said conductive sheet for coupling to a power
4 source;
5 (c) a plurality of load locations on said conductive sheet for coupling to at least one
6 load;
7 (d) a plurality of circular and non-noncircular resistances disposed on said
8 conductive sheet at an angle other than parallel or perpendicular to said at least
9 one source location. -

REMARKS

This application was filed on 07 May 1998 with a preliminary amendment claiming the priority date of U.S. Patent No. 5,841,074 filed on 12 March 1996. The Examiner did not enter the amendment stating that the text of the amendment did not correspond to the text of the parent application. The preliminary amendment did, in fact, amend the originally filed specification of the parent application, U.S. serial number 08/615,154, now issued as U.S. Patent No. 5,841,074 and those amendments were incorporated into the specification filed in this application.

In the first Examiner's Action of the application herein, the Examiner rejected claims 1-13 under 35 U.S.C. §112, second paragraph; and under 35 U.S.C. §112, first paragraph. The Examiner further separately rejected claims 9-13, 5, and 7-8 under 35 U.S.C. §112, first paragraph. Art was nevertheless applied and claims 1-2 and 4 were rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 5,523,921 to Van Lydegraf; and claim 3 was also rejected separately under 35 U.S.C. §103(a) as being unpatentable over Van Lydegraf '921. The Examiner further indicated that the subject matter of claims 9, 10-13, and 5, 7, and 8 is allowable, subject to the rejections under 35 U.S.C. §112, first and second paragraphs.

In a response mailed 10 February 2000, Applicants amended the specification and claims 2, 4-8, 11, and 13. The Examiner responded with a Notice to Applicants mailed 09 May 2000 stating that the amendment was not entered because allegedly "the amendments to the disclosure are not consistent with the disclosure on filed "

In response, Applicants respectfully submit this amendment which amends the specification and claims of the application filed on 07 May 1998 which incorporated the preliminary amendment. By way of the Examiner's suggestion, Applicants have amended the application to be a continuation-in-part application of the U.S. Patent No. 5,841,074. A new declaration and assignment are submitted. One independent claim has been added but Applicants have not added new matter. The new claim, claim 14, reads on Figure 3 and uses the language on page 7, lines 8-11. Claims 1-14 are pending in the application.

The Objection to the Drawings

In separate correspondence attached to this amendment, applicants submit a Proposed Amendment to the Drawing, complete with remarks addressing each of the Examiner's concerns.

Objections to the Specification

In paragraph 6 of the Examiner's Action mailed 10 December 1999, the Examiner objected to the specification.

First, the Examiner stated that source pins (30) are recited although no explanation is given as to what they are. In the objection to the drawing, the Examiner further states that no pins are shown in the figures. In response, throughout the specification, when referring to those locations into which electrical contact for a source and/or a load is to be made, the word "pin" has been changed to "location" and the word "pin" is left to mean "one of a conducting contact of an electrical connector." IBM DICTIONARY OF COMPUTING, McGraw-Hill, Inc. (1993) at 512.

The Examiner said that the last sentence of the first paragraph on page 5 was confusing. Applicants have deleted the sentence and have moved an amended sentence to page 8 of the specification.

The Examiner objected to use of the reference numbers (40) and (50) as referring to the power plane. The Examiner is correct and Applicants have amended the specification to reflect that the reference numeral 50 refers to the socket module in Figure 4 and the reference numeral 40 refers to the powerplane.

Applicants respectfully decline to amend the specification as suggested by the Examiner to insert "figures 2 and 4" on page 6, line 11 of the specification. The specification in the first paragraph refers specifically to Figure 2.

The Examiner did not understand what is meant by "stable" on page 7, line 5 of the specification. In response, Applicants have amended the sentence. No new matter has been added because the sentence paraphrases the previous sentence in the paragraph.

The Examiner has suggested that the abstract be amended and that the phrase "near zero" be stricken at the end of the abstract. The invention is described in these terms, as set forth in the specification on page 7, lines 2-4. Respectfully, Applicants decline the Examiner's suggestion and request the Examiner to withdraw this objection.

In paragraph 7, the Examiner further objected to the specification and the drawings for allegedly not showing every element of the claimed invention. Specifically, the Examiner said that the conductive sheet of (a) in claim is not shown or described with respect to the present invention. Respectfully, applicants believe that the conductive sheet is shown and described. On page 4, lines 16-19, the specification states, "[S]ome of the **conductive layers** 12a-i may be signal layers for signal propagation while others layers may be **powerplanes** for providing particular direct current (DC) voltage levels to the functional units." (emphasis added) The powerplane (40) shown in Figure 2, Figure 3, and Figure 4 is a conductive sheet or a

conductive layer. Respectfully, applicants request the Examiner to withdraw this objection to claim 1.

The Examiner further states that the source pins of claim 2 are not shown. With the amendments to the specification, source locations (30) are shown in Figure 2, Figure 3, and Figure 4, and are described in the specification on page 5. Applicants respectfully request the Examiner to withdraw this objection to claim 2.

The Examiner further states that the laminate and its layers, as in claim 4, are not shown. Again, respectfully, applicants request the Examiner to withdraw the objection. Figure 1 illustrates a laminated structure comprising a plurality of alternating conductive layers and interweaved dielectric layers, page 4, lines 4-6. One of those conductive layers may be a powerplane as shown in Figures 2 through 4. Therefore, the specification and the drawings show the claimed element of the plurality of interleaved dielectric layers and conductive layers.

The Examiner states that the connector straps and pads of claim 11 are not shown. Figure 2 and its description in the specification have been amended to shown connector straps or pads, wiring networks, etc. 28. By amending Figure 2 and the specification, applicants have not added new matter. Connector straps and pad were in the originally filed specification of the parent application on page 5, line 32 through page 6, line 1 and in the specification filed of this application on page 4, lines 23-24. Conventional features disclosed in the description and claims, where their detailed illustration is not essential for a proper understanding of the invention, should be illustrated in the drawing in the form of a graphical drawing symbol or a labeled representation (e.g., a labeled rectangular box). 37 CFR 1.83(a).

The Examiner states that the following elements of claim 13 are not shown: the means to variable increase the resistance of the powerplane between said plurality of source pins and said load pins, and the means to substantially reduce the voltage difference between the voltage difference between said near load pins and said distant load pins. Respectfully,

applicants direct the Examiner's attention to page 6, line 18 through page 7, line 22, in which describe the structure and the operation of how the resistance between the plurality of source pins and load pins can variably increase and how the voltage difference between near load pins and distant load pins is substantially reduced. To reiterate, page 7, lines 20-22 state that "resistances or impedance variations may represent voids or nonconductive materials or variations in the thickness of the powerplane 40 as described above." Applicants request the Examiner to withdraw the objection to claim 13.

REJECTION OF THE CLAIMS

In the Examiner's Action mailed 10 December 1999, the Examiner also rejected Claims 1-13 under 35 U.S.C. §112, first and second paragraphs. Each of these rejections will be addressed separately.

35 U.S.C. §112, second paragraph, rejection of Claims 1-13

In claims 1 and 4, the Examiner asserts that the "even distribution of current" is indefinite because it is unclear what constitutes even. Respectfully, applicants request the Examiner to withdraw this rejection because neither claim 1 nor claim 4 claims an "even distribution of current." Applicants respectfully request clarification from the Examiner.

In claim 1, the Examiner states that a "plurality of variable resistances" is misdescriptive because each of the resistances is not variable. Respectfully, applicants maintain that the resistances may indeed be variable because if one resistance is circular and if another resistance is noncircular, or if one resistance is a void and another resistance is a nonconductive material or a variation in the thickness of the powerplane, then the resistances will indeed be variable. A singly provided impedance variation or resistance will have a electrical resistance that varies from one in multiple rows. Applicants respectfully request the Examiner to withdraw this rejection of claim 1.

The Examiner rejected claim 2 and offered possible corrections to overcome the rejections. Applicants have amended the claim according to the Examiner's suggestions and thank the Examiner. Thus, applicants respectfully request the Examiner to withdraw the rejection of claim 2.

The Examiner rejected claim 4 as being indefinite because of the use of the term "powerplane" as not being consistent with the specification. Throughout the specification the term "powerplane" was used, e.g., page 1, lines 13-15 ([O]ther conductive layers [of the backplane] are used to distribute the power necessary for system operation. These conductive layers are known in the art as powerplanes); page 2, line 3; page 2, line 8; page 2, line 20; page 3, lines 5-8; page 3, line 15, page 3, line 18; page 3, line 21; page 4, line 18 (Some of the conductive layers 12a-i may be signal layers for signal propagation while other layers may be powerplanes for providing particular direct current (DC) voltage levels to the functional units In the exemplary embodiment, conductive layers 12a and 12i are signal layers and layers 12b-h are powerplanes.); page 4, lines 20-21; page 6, lines 1-5 (Figure 2 illustrates an exemplary powerplane 40 ... for distributing power ...); page 5, lines 9-14; page 7, line 11-22, etc. Applicants respectfully believe that the powerplane as claimed in claim 4 is consistent with the specification and request clarification if the Examiner maintains the rejection.

The dependency of claims 5-8 has been corrected and applicants apologize for the errors. Respectfully, proper antecedent basis has been provided in these claims and they are dependent upon independent claim 4.

The Examiner stated that claim 8 was indefinite because it recites details of the load not claimed in claim 4. Respectfully, claim 8 has been amended to specify a further limitation on the subject matter claimed: a load location being provided to couple said powerplane to at least one circuit board. Applicants respectfully request the Examiner to withdraw the rejection of amended claim 8.

The Examiner rejects claim 9 and claim 13 under 35 U.S.C. §112, second paragraph alleging that it is unclear which elements of the invention particular "means" pertain to or what exactly constitutes the "means." Respectfully, claims 9 and 13 are clear on their face in view of 35 U.S.C. §112, sixth paragraph which states "[A]n element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof." Applicants are not required to set forth the structure of the "means to distribute substantially the same amount of current from said power source to all of said at least one load" (claim 9) or the means to variable increase the resistance of the powerplane between said plurality of source means and said load pins, and means to substantially reduce the voltage difference between said near load pins and said distant load pins" (claim 13) in the claims themselves. Applicants respectfully submit that the specification provides sufficient disclosure for the structure and the equivalents thereof on pages 6 and 7 of the specification. Applicants respectfully request the Examiner to withdraw this rejection of claim 9 and 13.

The Examiner further rejects claim 9, 12, and 13 stating that it is unclear what range "substantially" contemplates. Independent claim 9 and 12 set forth, *inter alia*, a "means to distribute substantially the same amount of current from said power source to all of said at least one load." Substantially in claims 9 and 12 are used according to the second definition of substantially given in THE ENCARTA WORLD ENGLISH DICTIONARY, St. Martin's Press (1999) at 1781 in which *substantially* is "essentially, generally or in essence." In a real world with a real power source on a real conductive sheet coupled to real loads, it is difficult to distribute *exactly* the same current to all the loads located from the power source; but given the teachings of the invention to create variable impedances between the source and multiple loads, it is possible to distribute *substantially* the same current to any load irrespective of its position on the conductive sheet. Claim 13 provides for means to substantially reduce the voltage difference between said near load pins and said distant load pins. Similarly, in a real world it is virtually impossible to exactly reduce the voltage difference between said near load pins and said distant load pins to zero and so the first definition of substantially as given in THE ENCARTA WORLD ENGLISH DICTIONARY, St. Martin's Press (1999) at 1781 in which

substantially is “considerable in an extensive, substantial, or ample way” does particularly point out and distinctly claim the subject matter, given the plain meaning of the word “substantially.”

The Examiner also rejected claim 13 because the means to variably increase resistance is indefinite. As stated above in the Examiner’s objection to claim 13, applicants respectfully refer to page 6, line 18 through page 7, line 22, which describe the structure and function of how the resistance between the plurality of source pins and load pins can variably increase. Page 7, lines 20-22 state that “resistances or impedance variations may represent voids or nonconductive materials or variations in the thickness of the powerplane 40 as described above.” Applicants respectfully request the Examiner to withdraw the rejection to claim 13 on this basis.

35 U.S.C. §112, first paragraph, rejection of Claims 1-13

In paragraph 11 of the Examiner’s Action, the Examiner rejected claim 4, stating that the voltage difference being near zero is not described in the specification and it is unclear what range is contemplated by “near zero.” The specification at page 7, lines 2-4 states that, “[A]ccordingly, current is shared more evenly between load pins 20, 22 and the voltage difference between distant load pins 22 and near load pins 20 is reduced to **near zero**.” Respectfully, as stated above, it is virtually impossible in a real world given a real conductive sheet with a real power source and a real load to reduce the voltage difference to exactly zero; therefore one of ordinary skill in the art will appreciate that given the specifications for and the electrical and physical characteristics of the power source, the conductive sheet, the loads, he/she is enabled to reduce the voltage difference between near loads and far loads to near zero or that substantially the same current will be applied to the near and far loads, using the teaching of the invention. Applicants respectfully request the Examiner to withdraw the rejection of claim 4 on these grounds.

The Examiner further rejects claim 1 stating that the conductive sheet is not shown and described with respect to the present invention. As set forth above, applicants believe that the conductive sheet is shown and described. On page 4, lines 16-19, the specification states,

"[S]ome of the **conductive layers** 12a-i may be signal layers for signal propagation while others layers may be **powerplanes** for providing particular direct current (DC) voltage levels to the functional units." (emphasis added) The powerplane (40) shown in Figure 2, Figure 3, and Figure 4 is a conductive sheet or a conductive layer. Respectfully, applicants request withdrawal of this rejection of claim 1.

The Examiner further rejects claim 4 asserting that the laminate and its layers, as in claim 4, are not shown. Again, respectfully, applicants request the Examiner to withdraw the rejection. Figure 1 illustrates a laminated structure comprising a plurality of alternating conductive layers and interleaved dielectric layers, page 4, lines 4-6. One of those conductive layers may be a powerplane as shown in Figures 2 through 4. Therefore, the specification and the drawings show the claimed element of the plurality of interleaved dielectric layers and conductive layers.

The Examiner states that the connector straps and pads of claim 11 are not disclosed. Respectfully, connector straps and pad were disclosed in the originally filed specification of the parent application on page 5, line 32 through page 6, line 1 and in the specification filed of this application on page 4, lines 23-24. Figure 2 and its description in the specification have been amended to shown connector straps or pads, wiring networks, etc. 28. By amending Figure 2 and the specification, applicants have not added new matter.

The Examiner states that the variable resistances as claimed in claim 1 and the means to variably increase the resistance as recited in claim 13, line 7 are not disclosed. Respectfully, applicants direct the Examiner's attention to page 6, line 18 through page 7, line 22, in which describe the structure and the operation of how the resistance between the plurality of source pins and load pins can variably increase and how the voltage difference between near load pins and distant load pins is substantially reduced. Quite simply put, on page 7, lines 20-22 state that "resistances or impedance variations may represent voids or nonconductive materials or variations in the thickness of the powerplane 40 as described above." Further, 35 U.S.C. §112, sixth paragraph does not require that the structure be set

forth in claims 9 and 13 which it appears the Examiner is requiring. Applicants respectfully request the Examiner to withdraw the rejections to claim 1, claim 9, and claim 13.

Rejection of Claims 1-4 under 35 U.S.C. §§ 102(e) and 103(a)

The Examiner further rejected claims 1-2 and 4 under 35 U.S.C. §102(e) and claim 3 under 35 U.S.C. §103(a) in view of U.S. Patent No. 5,523,921 to Van Lydegraf ('921). Applicants respectfully traverse the rejections.

The '921 patent cannot anticipate applicants' invention as claimed in independent claims 1 and 4 and dependent claim 2 because it lacks a claimed element (d), i.e., *a plurality of variable resistances between said at least one source location and said plurality of load locations to distribute substantially the same amount of current from said at least one source location to each of said plurality of load locations.*

The '921 patent teaches a plurality of apertures on a ground or power plane to create **an isolation effect** between two circuits on the plane. Column 3, lines 45-47. In other words, [r]egardless of the pattern of the reference grid, ... the idea is to **separate the I/O circuitry currents from the rest of the PCA circuit** currents in such a way as to minimize the I/O reference plane/grid common mode potential (column 4, lines 16-19) It can be said that reference plane 42 is **divided and isolated** by slots 40 into an I/O reference plane 44 and a circuit reference plane 46. (Column 4, lines 37-39) Thus, the apertures of the '921 are to create or separate current between loads on a conductive plane rather than to distribute the same current to loads on the plane, as applicable to applicants' claim 1, or to distribute current so that the voltage difference between the load locations is reduced to near zero, as applicable to claim 4. Thus, the '921 patent cannot anticipate either independent claim 1 or independent claim 4 because the same current is not distributed to the loads on a conductive plane. Applicants respectfully request the Examiner to withdraw the rejection of claims 1, 2, and 4 under 35 U.S.C. 102(e).

The '921 patent cannot be used, moreover, to render applicants' claimed invention, as in claims 1-4, obvious because the very purposes of the two patents are at odds with each. One of ordinary skill in the art would not look to the '921 patent which teaches using apertures to electrically isolate circuits from each other on a conductive plane to using apertures on a conductive plane to provide substantially the same current to any load on the conductive sheet such that the voltage difference between the loads is reduced to near zero. Isolation of current between circuits or loads on the same conductive sheet is contrary to providing the same current from the same source to circuits or loads on the same conductive sheet. Respectfully, applicants request the Examiner to withdraw the rejection of claim 3 and any possible rejection of claims 1, 2, and 4 under 35 U.S.C. §103(a).

The Examiner stated that claims 9-13 and claims 5, 7, and 8, if they were dependent upon claim 9, contained allowable subject matter.


CONCLUSION

Applicants submit that the remarks and amendments to the specification overcome any objection to the specification and resulting rejection of the claims under 35 U.S.C. §112. With respect to the rejection under 35 U.S.C. §§ 102(e) and 103(a) based on Van Lydegraf '921, Applicants traverse the rejection because Van Lydegraf '921 does not disclose or suggest having variable resistances to distribute substantially the same amount of current from a source to each load on a conductive sheet; nor does Van Lydegraf '921 disclose or suggest variable resistances to distribute current so the voltage difference between loads on a conductive sheet is reduced to near zero.

Upon considering this amendment, the Examiner is respectfully urged to call the Applicants' attorney at the number below if any changes or corrections are deemed necessary for allowance of the present application. Applicants respectfully request reconsideration and an early allowance of the application by the Examiner.

Respectfully submitted,

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